

CLAIMS:

1. An oral appliance for placing in a mouth of a user, the appliance including:
 - a base member having a generally U-shaped form corresponding to the
 - 5 outline of a jaw of a user, the base member defining at least one channel within which an upper or lower row of teeth of a user can be received,
 - a teeth engaging element, associated with each channel, being made of a material able to be user conformed or user moulded to suit the individual mouth of the user, and;
 - 10 - shock absorption means associated with the base member and/or the teeth engaging element for absorbing impact shock.
2. Oral appliance according to claim 1, wherein the base member has a greater rigidity than the teeth engaging element.
- 15 3. Oral appliance according to claim 1 wherein the shock absorption means comprise one or more compressible areas associated with the base member and/or the teeth engaging element.
- 20 4. Oral appliance according to claim 1 wherein the shock absorption means comprise one or more spacings defined in the base member and/or a body of the teeth engaging element.
5. Oral appliance according to claim 1 wherein the shock absorption means
- 25 comprises one or more air channels defined in the base member.
6. Oral appliance according to claim 1 wherein the shock absorption means comprises one or more open air channels defined in the base member.
- 30 7. Oral appliance according to claim 5 wherein the air channels extend from an outer face of the base member, through the body thereof to an inner face of the base member.

8. Oral appliance according to claim 7 wherein the shock absorption means take the form of side open channels arranged in or near terminal ends of the generally U shaped form of the base member.

5

9. Oral appliance according to claim 8, further including at least one frontal open channel arranged in a front section of the base member.

10. Oral appliance according to claim 8 wherein the side open channels have a height in the range of 0.5-10mm and length lying in the range of 0.5-30mm.

10

11. Oral appliance according to claim 10 wherein the side open channels that are positioned proximate to the terminal ends of the generally U shaped form of the base member have a length lying in the range 10-20mm.

15

12. Oral appliance according to claim 9 wherein the frontal open channel of the base member has a length lying in the range 2-10mm.

13. Oral appliance according to claim 5 wherein the teeth engaging element is made of a continuous layer of thermoplastic material that encapsulates the base member to firmly and securely mount the layer of thermoplastic material on the base member.

20

14. Oral appliance according to claim 13 wherein the continuous layer of thermoplastics material substantially covers the complete surface area of the base member.

25

15. Oral appliance according to claim 13 wherein the layer of thermoplastic material defines one or more openings which correspond with at least one or more of the open channels arranged in the base member.

30

16. Oral appliance according to claim 13 wherein the layer of thermoplastic material extends across and covers the one or more openings which correspond with

the at least one or more channels arranged in the base member and closes off the interior space defined by the channels.

17. Oral appliance according to claim 13 wherein the layer of thermoplastic material is EVA (ethylvinylacetate) which softens at a temperature of 90°C - 95°C.
18. Oral appliance according to claim 13 wherein the layer of thermoplastic material forming the teeth engaging elements has a thickness of 1mm – 3mm.
19. Oral appliance according to claim 1 wherein the base member is formed from a rigid plastics material, which is not user conformable or mouldable in boiling water.
20. Oral appliance according to claim 19 wherein the rigid plastics material comprises a non-thermoplastic material either alone or in combination with another plastics material.
21. Oral appliance according to claim 20 wherein the non-thermoplastic material comprises polyethylene, polyurethane, polypropylene or santoprine.
22. Oral appliance according to claim 20 wherein the other plastics material is a thermoplastic material and the thermoplastic material is 10% or less by weight of the base member.
23. Oral appliance according to claim 22 wherein the base member comprises 3-8% by weight of thermoplastic material that is EVA and the balance is polyethylene.
24. Oral appliance according to claim 22 wherein the base member comprises 4-6% by weight of thermoplastic material that is EVA and the balance is polyethylene.
25. Oral appliance according to claim 21 wherein the non-thermoplastic material comprises polyethylene on its own.

26. Oral appliance according to claim 1 wherein the base member has inner and outer flanges interconnected by a web which collectively define upper and lower channels within which the upper and lower rows of teeth of the user are receivable, wherein an upper teeth engaging element is receivable in the upper channel and a lower teeth engaging element is receivable in the lower channel.

27. Oral appliance according to claim 1 further including a tongue tag on the inner flange of the base member, the tongue tag being substantially centrally positioned for correctly positioning the tongue of a user during use, and a cut-out defined in the outer flange of the base member for allowing the appliance to adapt to varying arch sizes, and breathing apertures defined in the base member for facilitating breathing by a user when wearing the appliance.

28. Oral appliance according to claim 1 further including locating means for correctly locating and positioning the jaws in the teeth engaging element during fitting of the oral appliance.

29. Oral appliance according to claim 28 wherein the locating means comprise a brace arranged externally on the teeth engaging element.

30. Oral appliance according to claim 28 wherein the brace comprises rubber.

31. An oral appliance for placing in a mouth of a user, the appliance including:

- a base member having a generally U-shaped form corresponding to the outline of a jaw of a user, the base member defining at least one channel within which an upper or lower row of teeth of a user can be received, and wherein the base member is made of polyethylene with less than 10 % by weight of a thermoplastics material

- a teeth engaging element mounted over the base member in each channel made of a thermoplastics material that is able to be user conformed or user moulded to suit the individual mouth of the user.

32. An oral appliance according to claim 31, wherein the base member is made of polyethylene with 3-8% by weight of thermoplastics material.

5 33. An oral appliance according to claim 31, wherein the base member is made of polyethylene with 4-6% by weight of thermoplastics material.

34. An oral appliance according to claim 31, wherein the base member is made of high density polyethylene with 4-6% by weight of thermoplastics material which is EVA and each teeth engaging element is made of EVA.

10

35. An oral appliance according to claim 31, wherein the base member defines only an upper channel within which upper teeth of a user are received.

15 36. A method of manufacturing an oral appliances for placing in the mouth of a user, the method including the steps of:

20 - molding a base member from plastic material in a first molding step in a first mould, the member having a generally U-shaped form corresponding to the outline of the jaw of a user and inner and outer flanges interconnected by a web which define at least one of upper and lower channels within which the corresponding rows of teeth of a user are received;

25 - arranging one or more spacings in the base member and;
- removing the base member from the first mould and placing it in a second mould having a larger mould cavity and moulding a continuous layer of thermoplastic material onto the base member to form at least one of the upper and lower teeth engaging elements capable of being customised to suit the mouth of a user, the layer encasing the member to thereby firmly and securely mount the layer of thermoplastic material on the base member.

30 37. A method according to claim 36 wherein the continuous layer of thermoplastic material is molded substantially fully across the surface area of the base member in said second molding step.

38. A method according to claim 35 wherein the base member is injection molded from polyethylene, polyurethane, polyethylene, polypropylene or santoprine.
- 5 39. A method according to claim 37 wherein the layer of thermoplastic material is injection molded from EVA while it is locked in position in the second mould.
- 10 40. A base member for an oral appliance for placing in a mouth of a user, having a generally U-shaped form corresponding to the outline of a jaw of a user, the base member defining at least one channel within which an upper or lower row of teeth of a user can be received, the base member further comprising shock absorbing means taking the form of pre-designated compressible sections in order to substantially absorb impact shock.
- 15 41. A base member according to claim 40 comprising a first material, preferably being polyethylene and a second material, being EVA, wherein the weight percentage of EVA in the base member preferably lies in the range 0.5-10% and is more preferably in the range 4-8%.
- 20 42. A base member according to claim 41 being at least semi-flexible and non-thermoplastic.
- 25 43. A moldable teeth engaging element for co-operation with a base member according to claim 40 for an oral appliance, the element being made of a material able to be user conformed or user molded to suit the individual mouth of the user, provided with locating means for correctly locating and positioning the jaws in the teeth engaging element.
- 30 44. A method of fitting an oral appliance, as described in claim 1 comprising the step of immersing the oral appliance in water having a temperature sufficiently high to make the teeth engaging element moldable,
- inserting the appliance into a user's mouth;

- biting into the teeth engaging element to mould the teeth engaging element to the form of the user's jaw, and thereafter allowing the teeth engaging element to harden.

5 45. A method for protecting teeth from impact shock comprising the step of inserting an oral appliance, fitted according to claim 44, into a user's mouth before partaking of any activity whereby use of a mouthguard is desirable.

10 46. A guard for placing in the mouth of a user to perform a protective function, the guard including: a base member having a generally U-shaped form corresponding to the arch of a jaw of a user having a front region extending back via two arms to a rear end, the base member defining at least an upper channel within which the upper jaw of a user can be received; a teeth engaging element received in each said channel that is made of a material that is able to be user moulded to fit
15 the mouth of a user, the base member including a shock absorber for absorbing energy from an impact to the guard, the shock absorber comprising at least one side opening defined in the outer flange of each said arm and a front opening defined in the outer flange of the front region.

20 47. A guard according to claim 47, wherein the guard defines only an upper said channel to fit over the upper arch of the use.

25 48. A guard according to claim 48, wherein the outer flange includes a downward extension or skirt that extends down from the web in a direction away from the upper channel and the side openings are defined in the outer flange in the flange or skirt below the web.

30 49. A guard according to claim 49, wherein the front opening is also defined in the outer flange below the web.

50. A guard according to claim 50, wherein each of said side and front openings is elongate with the longitudinal axis of the opening being substantially parallel to the upper channel.